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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/629,165	07/29/2003	Yoichi Sano	Hiroshi Tanaka C-3	5995

23474 7590 03/19/2007
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EXAMINER	
SMITH, NICHOLAS A	
ART UNIT	PAPER NUMBER
1742	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
2 MONTHS	03/19/2007	PAPER

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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/629,165
Filing Date: July 29, 2003
Appellant(s): SANO, YOICHI

MAILED
MAR 1 9 2007
GROUP 1700

Terryence F. Chapman
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 4 December 2006 appealing from the Office action mailed 30 March 2006.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

6,464,845	Shirota et al.	10-2002
5,445,722	Yamaguti et al.	8-1995

5,837,124	Su et al.	11-1998
6,143,163	Sawamoto et al.	11-2000

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim 3-4, 6-8 and 12-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shirota et al. (US Patent No 6,464,845) in view of Yamaguti et al. (US Patent No. 5,445,722).

Regarding claim 12, Shirota et al. teaches a method for producing acidic and alkaline electrolyzed water using a two-chamber electrolysis cell (see figure 2A). The cell consists of an anode 2e inside an anode chamber 2a and a cathode 2f inside a cathode chamber 2c. The two chambers are divided by a diaphragm 2g. An electrolyte is added to the water to be electrolyzed (column 9, lines 65-67). Only the water provided to the cathode is previously softened. Shirota et al. teaches that the water used in the anode chamber is tap water, i.e., not softened water. See column 10, lines 1-5 and 21-25. In reference to a similar alkaline ionized water and acidic water apparatus as described in Figure 1A, Shirota et al. clearly discloses using pure water (column 7, lines 41-50) to feed the reservoir [Figure 1A (4)]. One skilled in the art knows pure water lacks ions, which by definition would be free of dissolves salts of magnesium, calcium and iron, thus qualifying as the claimed softened water. Said reservoir would also not contain any dissolved salts of magnesium, calcium or iron, as none are added during the process, so reservoir would only be filled with softened water. This reservoir is what

feeds the cathode chamber, and thus Shirota et al. teaches feeding softened water to the cathode chamber.

However, Shirota et al. does not teach that the flow rate of water supplied to the cathode chamber is no greater than 40 mL/min per ampere loading current as claimed.

Yamaguti et al. teaches a method for producing electrolyzed water wherein the degree of electrolysis can be controlled in order to obtain water with a desired pH and electrical conductivity. This control is accomplished by varying the ratio between the flow rate of water into the cell and the applied current (column 12, lines 21-30).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Shirota et al. by optimizing the ratio of flow rate in the cathode chamber to applied current as disclosed by Yamaguti et al., because Yamaguti et al. teaches that this ratio is a result-effective variable (column 12, lines 21-30). See MPEP 2144.05 IIB.

Regarding claim 13, Shirota et al. teaches a method for producing acidic and alkaline electrolyzed water using a three-chamber electrolysis cell (see figure 1A). The cell consists of an anode 2e inside an anode chamber 2a and a cathode 2f inside a cathode chamber 2c. There is an intermediate chamber 2b between the anode and cathode chambers, and the three chambers are divided by diaphragms 2d and 2d'. The intermediate chamber contains an electrolyte solution that can permeate the membranes (column 7, lines 18-26 and 62-66). Only the water provided to the cathode is previously softened. The anode water is tap water (column 7, lines 4-7) and the cathode water is softened (column 7, lines 41-50, also see argument above for claim

12). When a current is applied to the cell, acidic water is generated at the anode and basic water is generated at the cathode (column 7, line 62 to column 8, line 2).

Regarding to the flow rate of the softened water to the cathode chamber, the rejection ground is given above.

Regarding claims 3, 6 and 14, Shirota et al. teaches that the pure water is produced for the cathode chamber using a purifying apparatus containing an ion exchange resin (column 18, lines 19-21).

Regarding claims 4, 7, and 8, it would have been obvious to one of ordinary skill in the ad at the time of the invention to modify the method of Shirota et al. by optimizing the ratio of flow rate in the anode chamber to applied current as disclosed by Yamaguti et al., because Yamaguti et al. teaches that this ratio is a result-elective variable (column 12, lines 21-30). See MPEP 2144.05 IIB.

Claims 5 and 9-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shirota et al. in view of Yamaguti et al. as applied to claims 3-4, 6-8 and 12-14 above, and further in view of Su et al. (US Patent No. 5,837,124).

Shirota et al. and Yamaguti et al. teach the features as previously described. Furthermore, Shirota et al. teaches that alkaline water having a pH ranging from 12 to 13 is produced in the cathode chamber, and that this pH range is desirable for its antibacterial effects (see Table 2 and column 21, lines 37-43). Although these references do not expressly teach diluting the electrolyzed water to obtain the desired pH range, it would have been obvious to one of ordinary skill in the art at the time of the invention to adjust the pH of the alkaline water by adding neutral water in order to obtain

the claimed pH range, because Shirota et al. teaches that water of this pH is preferred for its antibacterial effects (see Table 2 and column 21, lines 37-43).

However, Shirota et al. in view of Yamaguti et al. does not teach diluting the anode water such that the pH is between 2 and 4.

Su et al. teaches a method for producing electrolyzed water in which the desired pH range of the anode water is from 2 to 4 (column 5, lines 6-18). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Shirota et al. in view of Yamaguti et al. by adjusting the pH of the anodic water by adding neutral water to obtain the claimed pH range, because Su et al. teaches that this range is desirable for preventing formation of scale (column 3, lines 15-18).

Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shirota et al. in view of Yamaguti et al. as applied to claim 12 above, and further in view of Sawamoto et al. (US Patent US 6,143,163).

Shirota et al. and Yamaguti et al. teach the features as previously described in the rejection of claim 12.

However, Shirota et al. in view of Yamaguti et al. does not teach adding electrolyte to the feed of the cathode chamber.

Sawamoto et al. teaches a method of adding supporting electrolyte to the cathode liquid. (column 1, lines 62-65). It would have been obvious to one of ordinary skill in the art at the time of the invention to add an electrolyte to the feed for the cathode

chamber, because Sawamoto et al. teaches that it is desirable to impart ionic conductivity in the apparatus (column 1, lines 62-65).

(10) Response to Argument

Appellant has argued:

1. None of the prior art teaches, suggests or discloses supplying softened water to the cathode chamber. Furthermore, primary reference Shirota et al. states that make-up water for the cathode chamber may be tap water (Shirota et al., col. 7, lines 42-44). Furthermore, Shirota et al. discloses use of pure water and Applicant's state there is a difference between pure water and softened water.

    a. Softened water is free of calcium, magnesium and other divalent and higher cations and instead contains sodium ions.

    b. Pure water is free of ions.

    c. Producing softened water is less expensive than producing pure water.

2. None of the prior art teaches, suggests or discloses controlling the flow rate of softened water to be supplied to the cathode chamber to an amount no greater than 40 mL/min. per ampere of loading electric current. Furthermore, Yamaguti et al. discloses a control equation at column 8, line 39 expressed in flow rate and not amps. Furthermore, Yamaguti et al. discloses current at a set value of 30 amps at 16 volts such as at column 7, lines 24-50.

3. Applicant refers to specification for data that points out Applicant's invention, wherein feeding softened water only to the cathode with an amount no greater than 40

mL/min. per ampere of loading electric current results in minimal scale in the cathode compartment, establishing criticality of these features.

Examiner responds:

1. Examiner agrees that pure water and softened water are different in that softened water contains ions, such as sodium. Examiner points out that pure water is the make-up water in Shirota et al. (Figure 1-A, **7a'**). However, this is only the make-up water, and tank (**4**) contains both an amount of make-up water and processed, alkaline water (**81**). Tank water is then fed to the cathode chamber (**2c**) via a line (**8a**). It is known that sodium ions would migrate from intermediate chamber (**2b**) to the cathode chamber (**2c**) across the membrane (**2d'**) in that intermediate chamber (**2b**) is fed with sodium chloride solution (Shirota et al., col. 7, lines 4-26). Thus, alkaline water (**81**) would contain sodium ions. Since there are no hard cations and there are sodium ions present in tank (**4**), it is clear that water in line **8a** is softened water, and thus meets the instant claims. Arguments toward the economic advantages of using a source of softened water versus the setup of Shirota et al. (note, only a "make-up" amount of pure water is used) should be placed in evidence form, i.e., a declaration, in order to be given proper consideration.

2. Yamaguti et al. teaches a method for producing electrolyzed water wherein the degree of electrolysis can be controlled in order to obtain water with a desired pH and electrical conductivity. This control is accomplished by varying the ratio between the flow rate of water into the cell and the applied current (column 12, lines 21-30).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Shirota et al. by optimizing the ratio of flow rate in the cathode chamber to applied current as disclosed by Yamaguti et al., because Yamaguti et al. teaches that this ratio is a result-effective variable (column 12, lines 21-30). See MPEP 2144.05 IIB. Therefore, Shirota et al. in view of Yamaguti et al. meet the instant claims.

3. Applicant has not demonstrated the criticality of range of flow rate (F) not greater than 40mL/min. per ampere. The applicant has not demonstrated that F40 as claimed has superior properties in comparison with F41. It is noted that F15 (example 1, p. 10, instant specification) in comparison with F154 (comparative example 1, p. 11, instant specification) does not demonstrate criticality between F40 and F41 as necessary to demonstrate criticality. Furthermore, it is noted that the features upon which applicant relies (i.e., results of no scale deposits on the cathode during the electrolysis process and prevention of precipitation of sludge or scale in lines or tanks in the alkaline water product stream) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

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Patent Examiner

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